Ann wanted to discover the right amount of water to use on a plant. She believed the package recommendation of 50 ml would be best. She planted 10 seeds in each of 5 pots found around the house that contained 500g of “Pete’s Potting Soil.” The pots were given the following amounts of distilled water each day for 40 days: Pot 1, 50ml; Pot 2, 100ml; Pot 3, 150ml; Pot 4, 200ml; Pot 5, 250ml. The height of each plant was measured at the end of the experiment.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

Gloria wanted to find out if the color of food would affect whether kindergarten children would select it for lunch. She didn’t think that any color would be preferred. She put food coloring in 4 identical bowls of mashed potatoes. The colors were red, green, yellow, and blue. Each child chose a scoop of potatoes of the color of their choice. Gloria did this experiment using 100 students. She recorded the number of students that chose each color.

1. What is the problem?
2. What is the hypothesis?
3. How many children would Gloria expect to pick each color if her hypothesis is correct?

Gloria wanted to find out if the color of food would affect whether kindergarten children would select it for lunch. She didn’t think that any color would be preferred. She put food coloring in 4 identical bowls of mashed potatoes. The colors were red, green, yellow, and blue. Each child chose a scoop of potatoes of the color of their choice. Gloria did this experiment using 100 students. She recorded the number of students that chose each color.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

Susie wondered if the height of the hole punched in the side of a quart-sized milk carton would affect how far from the container a liquid would spurt when the carton was full of the liquid. She used 4 identical cartons and punched the same size hole in each. The hole was placed at a different height on one side of each of the containers (5, 10, 15, and 20cm from the base of the carton). She put her finger over the hole and filled carton to a height of 25cm with liquid. When each carton was filled, she placed it in the sink and removed her finger. Susie measured how far away from the carton’s base the liquid had squirted when it hit the bottom of the sink.

1. What is the problem?
2. Is the hypothesis stated? If so, what is it?
3. How can Susie make sure her results are valid?

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1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

Sandy heard that plants compete for space. She didn’t believe it, so she decided to test this idea. She bought a mixture of flower seeds and some potting soil. Into each of 5 plastic cups she put the same amount of soil. In the first cup she planted 2 seeds, in the second cup she planted 4 seeds, in the third cup 8 seeds, and in the fourth cup she planted 16 seeds. In the last cup she planted 32 seeds. After 25 days, she determined which set of plants looked the best.

1. What is the problem?
2. What is the hypothesis?
3. How can Sandy improve her experiment?

Sandy heard that plants compete for space. She didn’t believe it, so she decided to test this idea. She bought a mixture of flower seeds and some potting soil. Into each of 5 plastic cups she put the same amount of soil. In the first cup she planted 2 seeds, in the second cup she planted 4 seeds, in the third cup 8 seeds, and in the fourth cup she planted 16 seeds. In the last cup she planted 32 seeds. After 25 days, she determined which set of plants looked the best.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

Esther became interested in insulation while her parent’s new house was being built. She decided to determine which insulation transferred the least heat. She suspected that foam insulation would transfer less heat than fiberglass insulation. She filled each of 5 jars half-full with water. She sealed each jar with a plastic lid. Then she wrapped each jar with a different kind of insulation. She put the jars outside in the direct sunlight. Later, she measured the temperature of the water in each jar.

1. What is the problem?
2. What is the hypothesis?
3. What other information does Esther need to provide so that her experiment can be replicated?

Ester became interested in insulation while her parent’s new house was being built. She decided to determine which insulation transferred the least heat. She suspected that foam insulation would transfer less heat than fiberglass insulation. She filled each of 5 jars half-full with water. She sealed each jar with a plastic lid. Then she wrapped each jar with a different kind of insulation. She put the jars outside in the direct sunlight. Later, she measured the temperature of the water in each jar.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

After studying about recycling, John’s lab group compared the effect of different aged grass compost on bean plants. Because decomposition is necessary for the release of nutrients, the group hypothesized that older grass compost would produce taller bean plants. Three flats of bean plants were grown for five days. The plants were then fertilized as follows: (a) Flat A: 450g of 3 month old compost, (b) Flat B: 450 g of 6 month old compost, (c) Flat C: 0g compost. The plants received the same amount of sunlight and water each day. At the end of 30 days the group recorded the height of the plants (cm).

1. What is the problem?
2. What is the hypothesis?
3. Does this experiment have a control? If so, what is it? If not, what should it be?

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1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

Sammie and George want to find out which liquid freezes faster: kool-aid or water. They believe that water will freeze faster. They filled two ice cube trays – one with water and the other with kool-aid. They then placed the trays in the same freezer and timed how long it took each tray of liquid to freeze.

1. What is the problem?
2. What is the hypothesis?
3. What can Sammie and George do to make their experiment more valid?

Sammie and George want to find out which liquid freezes faster: kool-aid or water. They believe that water will freeze faster. They filled two ice cube trays – one with water and the other with kool-aid. They then placed the trays in the same freezer and timed how long it took each tray of liquid to freeze.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 constants?

A group of 10 college students was given a short course in speed-reading. The instructor was curious if a monetary incentive would influence performance on a reading test taken at the end of the course.  She believed that students would do better on a test if they were paid. Five of the students were offered $5 for obtaining an A on the test, the other five were not offered money.  The professor then averaged the scores on the test for each group.

1. What is the problem?
2. What is the hypothesis?
3. What can the professor do to make the experiment more valid?

A group of 10 college students was given a short course in speed-reading. The instructor was curious if a monetary incentive would influence performance on a reading test taken at the end of the course.  She believed that students would do better on a test if they were paid. Five of the students were offered $5 for obtaining an A on the test, the other five were not offered money.  The professor then averaged the scores on the test for each group.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 things the professor should keep constant?